

CLAIMS

1. A method for forming an electromagnetic transducer, the method comprising:

forming a first soft magnetic pole layer having a substantially flat surface;

forming an inorganic nonferromagnetic layer over said first pole layer, including forming an inorganic nonferromagnetic apex region having a side that is not parallel and not perpendicular to said surface;

forming a second soft magnetic pole layer over said inorganic nonferromagnetic apex region.

2. The method of claim 1, further comprising:

forming a hardbaked photoresist mask over said inorganic nonferromagnetic layer;

wherein forming said inorganic nonferromagnetic apex includes etching said hardbaked photoresist mask and said inorganic nonferromagnetic layer to create said inorganic nonferromagnetic apex region.

3. The method of claim 1, further comprising:

forming a photoresist mask over said inorganic nonferromagnetic layer, said mask terminating adjacent to a desired location of said side;

wherein forming said inorganic nonferromagnetic apex region includes:

depositing said inorganic nonferromagnetic layer on said first soft magnetic pole layer and said photoresist mask; and

chemically removing said photoresist mask.

4. The method of claim 1, further comprising:
forming a photoresist mask over said inorganic nonferromagnetic layer, said mask terminating adjacent to a desired location of said side;
wherein forming said inorganic nonferromagnetic apex region includes:
chemically etching said inorganic nonferromagnetic layer.

5. The method of claim 1, further comprising:
forming an inorganic dielectric layer adjacent to said inorganic nonferromagnetic apex region; and
forming an electrically conductive coil layer atop said inorganic dielectric layer.

6. The method of claim 1, further comprising:
forming a submicron inorganic nonferromagnetic layer adjacent to said region of inorganic nonferromagnetic material;
wherein forming said second soft magnetic pole layer over said inorganic nonferromagnetic apex region includes forming said second soft magnetic layer over said submicron inorganic nonferromagnetic layer.

7. The method of claim 1, further comprising:
forming an inorganic dielectric layer that partly covers said first soft magnetic pole layer, prior to forming said inorganic nonferromagnetic apex region; and
positioning said inorganic nonferromagnetic apex region partly over said first soft magnetic pole layer and partly over said inorganic dielectric layer.

8. A method for forming an electromagnetic transducer, the method comprising:

forming a first soft magnetic layer having a substantially flat surface;

forming an inorganic nonferromagnetic layer over said soft magnetic pole layer;

forming a photoresist mask atop said inorganic nonferromagnetic layer;

curing said photoresist mask to form a hardbaked photoresist mask;

etching said hardbaked photoresist mask and said inorganic nonferromagnetic layer,

including removing said hardbaked photoresist mask, and

thereby forming a region of inorganic nonferromagnetic material over said first soft magnetic layer.

9. The method of claim 8, wherein:

forming said region of inorganic nonferromagnetic material includes forming a side of said region that is not parallel and not perpendicular to said surface.

10. The method of claim 8, wherein:

forming said region of inorganic nonferromagnetic material includes etching said inorganic nonferromagnetic layer into a shape that substantially duplicates a shape of said mask.

11. The method of claim 8, further comprising:

forming a second soft magnetic layer over said region of inorganic nonferromagnetic material.

12. The method of claim 8, further comprising:
forming an inorganic dielectric layer adjacent to
said region of inorganic nonferromagnetic material; and
forming an electrically conductive coil layer
atop said inorganic dielectric layer.

13. The method of claim 8, further comprising:
forming a submicron inorganic nonferromagnetic
layer adjacent to said region of inorganic nonferromagnetic
material; and
forming a second soft magnetic layer over said
region of inorganic nonferromagnetic material and said
submicron inorganic nonferromagnetic layer.

14. The method of claim 8, further comprising:
forming an inorganic dielectric layer that partly
covers said first soft magnetic layer, prior to forming
said inorganic nonferromagnetic layer;
positioning said mask such that said region of
inorganic nonferromagnetic material is disposed partly on
said first soft magnetic layer and partly on said inorganic
dielectric layer.

15. A method for forming an electromagnetic transducer,
the method comprising:
a step for forming a first soft magnetic pole
layer having a substantially flat surface;
a step for forming an inorganic nonferromagnetic
apex region over said first soft magnetic pole layer to
have a sloping surface;
a step for forming a second soft magnetic pole
layer over said inorganic nonferromagnetic apex region.

16. The method of claim 15, wherein said step for forming said inorganic nonferromagnetic apex region further comprises:

forming an inorganic nonferromagnetic layer;
forming a hardbaked photoresist mask over said inorganic nonferromagnetic layer; and

etching said hardbaked photoresist mask and said inorganic nonferromagnetic layer to create said inorganic nonferromagnetic apex region.

17. The method of claim 15, wherein said step for forming said inorganic nonferromagnetic apex region further comprises:

forming an inorganic nonferromagnetic layer;
forming a photoresist mask over said inorganic nonferromagnetic layer, said mask terminating adjacent to a desired location of said sloping surface;

depositing an inorganic nonferromagnetic layer including said inorganic nonferromagnetic layer apex region on said first soft magnetic pole layer and said photoresist mask; and

chemically removing said photoresist mask.

18. The method of claim 15, wherein said step for forming said inorganic nonferromagnetic apex region further comprises:

forming an inorganic nonferromagnetic layer;
forming a photoresist mask over said inorganic nonferromagnetic layer, said mask terminating adjacent to a desired location of said sloping surface;

chemically etching said inorganic nonferromagnetic layer.

19. The method of claim 15, further comprising:

forming an inorganic dielectric layer that partly covers said first soft magnetic pole layer, prior to forming said inorganic nonferromagnetic apex region; and

positioning said inorganic nonferromagnetic apex region partly over said first soft magnetic pole layer and partly over said inorganic dielectric layer.

20. The method of claim 15, further comprising:

forming a submicron inorganic nonferromagnetic layer adjacent to said inorganic nonferromagnetic apex region;

wherein forming said second soft magnetic pole layer over said inorganic nonferromagnetic apex region includes forming said second soft magnetic layer over said submicron inorganic nonferromagnetic layer.

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